slave crop, the South may conveniently be divided into two parts. each having varied topography and soils. The Tobacco South lay north of the isotherm which conditioned the profitable cultivation of cotton. Tobacco here was the main crop with cereals as subsidiary crops. Beginning on the Coastal Plain, the culture of tobacco with its concomitant system of slave labor, expanded first to the Piedmont, later to the Great Valley and Ridge Belt, and finally to western Kentucky and Tennessee, being concentrated especially in the two limestone basins of those states.

In early colonial times, slavery acquired and maintained a strong foothold in the Sea Islands, and the adjacent mainland in South Carolina and Georgia with rice, indigo and sea island cotton as the main crops. The Cotton South began when upland cotton became available, and slavery and upland cotton cultivation expanded together. The first notable expansion was from the Sea Island region to the Piedmont and inner Coastal Plain in South Carolina and Georgia, which became known as the Eastern Cotton Belt. The last expansion was into the Western Cotton Belt which included mainly the Gulf Coastal Plain and the Mississippi Lowland.

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## SLEEPING SICKNESS IN UGANDA

BY

PETER MAC QUEEN*

About twenty miles from Kampala lies the hospital Kyetume, where I was told there were 700 patients suffering from sleeping sickness. I decided to stop over night at the hospital. I was most hospitably received by Dr. Claude Marshall, who was then in charge. Sleeping sickness came into Uganda about four years ago. It is caused by the bite of the tsetse fly, which was brought from the Congo by the caravans passing through with ivory to the coast. In four years 250,000 of the most promising natives of Africa have died from the terrible disease. No man who has had an attack of sleeping sickness has ever yet authentically recovered.

The hospital is laid out among beautiful gardens, on a hill overlooking a splendid agricultural section. Most of the patients are treated in a village which the English Government has established.

* By the courtesy of Messrs. L. C. Page & Company, Boston, these extracts on Sleeping Sickness in Uganda are here reproduced from Mr. Mac Queen's excellent book "In Wildest Africa."

Those who are not seriously ill are kept in the village until the disease has made considerable progress. After that they are brought into the general buildings of the hospital itself. The disease will kill a man in any space of time, running from two days to two years. No absolute cure of the disease has yet been found.

Great Britain is making gigantic efforts to thwart the power of this dreadful foe. Already she has under the care of skilled physicians no less than 20,000 patients. The people living along the shores of Lake Victoria Nyanza have been removed back into the country several miles, and every possible attempt has been made to exterminate the tsetse fly. The most successful attempt yet made has been the planting of a certain shrub in the marshes where the fly lives. The shrub is certain death to the tsetse fly. The area infected by the sleeping sickness thus far has been confined to the islands in the northwest of Lake Victoria Nyanza, and the shoreland from Entebbe to Jinja, a distance of about ninety miles. But the fear is that the disease will spread through all the provinces of the Upper Nile; and at the present rate of decrease in population it is estimated that in twenty-five years the entire population of Uganda will have disappeared. It might also spread to the Sudan, Rhodesia and Portuguese and Africa and decimate half the continent. The tsetse fly, whose scientific name is *glossina palpalis,* breeds in moist and swampy land. Scientists believe that it gets some of its virus from the body of the crocodile. Dr. Koch declares that it also feeds on the bodies of waterfowl frequenting swamps. If it bites a person after it has imbibed this virus, or after it has bitten a human being infected with the sleeping sickness, that person is almost certain to develop the fatal malady.

On the island of Buvuma it was estimated four years ago that there were 20,000 healthy people; to-day I am told there are less than twenty individuals. In the Sesse Islands, of a population of 30,000 four years ago, only 12,000 remain to-day. These are examples of the devastation of this gruesome pest. The British authorities have established six great hospitals or stations in Uganda for the treatment of sleeping sickness. They contain nearly 20,000 patients and are located as follows: (1) Sesse Island; (2) Kyetume, near Kampala; (3) Busu in Usoga; (4) Bulumasi; (5) Island of Buvuma; (6) Entebbe. The treatment followed in these hospitals is an injection of atoxyl, composed of arsenic, aniline and carbolic acid, discovered by Dr. Koch, the famous German specialist on tuberculosis. During 1908, in his official report to the Minister of the Interior with regard to the progress made by the German expedition

sent to East Africa to investigate the sleeping sickness, Professor Koch announced that he had discovered a specific against sleeping sickness similar to that which the doctors already possess against malaria in quinine. The remedy, which is a preparation of arsenic, is called atoxyl, and destroys the trypanosomes, the germs of the disease.

Professor Koch's close inspection of the habits of the *glossina palpalis,* which British investigation had already proved to be a disseminator of the disease, led him to the conclusion that the sleeping sickness can be spread also by other insects, such as for instance, the *glossina fusca.* The *glossina* lives principally on the banks of lakes, among stones, dried branches and plants; and feeds on the blood of the waterfowl which frequent the surface of the water, and also on the blood of crocodiles. These latter animals, Professor Koch declares are one of the chief reasons for the existence of the *glossina* in the Victoria Nyanza territory.

In order to study the *glossina* and the sleeping sickness together, Professor Koch availed himself of the offer of an empty mission-house placed at his disposal by the British authorities at Bengala, in the Sesse Islands, to the northwest of the Victoria Nyanza. The Professor came to the conclusion that the only remedy which would be efficacious would be one that destroyed the trypanosomes in the infected persons, as quinine annihilates malaria parasites. After various experiments, Professor Koch decided to employ atoxyl injections of half a gramme in solution, which proved most efficacious and caused no harm. Six hours after the subcutaneous injections had been made the trypanosomes were unchanged, but eight hours after there was no sign of trypanosomes, while the general condition of the patient had improved. In three weeks patients who were seriously ill when the treatment began, and who, without atoxyl, would certainly have died, had improved to such an extent as to leave no doubt in the Professor's mind of the efficacy of the remedy.

Unfortunately, a week after Dr. Koch's report appeared, Sir P. Monson wrote to the *Times* that it was optimistic, that a relapse invariably occurred, and that trypanosomes were found in the blood even after a year's alleged cure. He gave cases where monkeys that had been inoculated with the blood of patients who had undergone arsenic treatment soon weakened and died of sleeping sickness.

In August, 1907, Sir Hesketh Bell, the Governor of Uganda, put forward a scheme for the suppression of sleeping sickness and the Treasury authorized the expenditure of the funds required for this work. According to Sir Hesketh Bell's plan, the natives were to be

removed from the fly-infested district on the shores of Lake Victoria to healthy locations inland. The sick were to be placed in segregation camps, where they will undergo the so-called atoxyl treatment. It was estimated that some 20,000 people would have to be dealt with in this manner. It was further intended that all landing stages along the shore of the Victoria Nyanza should be freed from the presence of the tsetse fly by means of a complete clearance of all vegetation. Fords, ferries, and waterholes were to be similarly dealt with, and it was hoped that, by constant and consistent efforts in this direction, sleeping sickness would gradually be stamped out in Uganda. It is a matter for satisfaction that the chiefs fully appreciate the steps that are being taken, and are working loyally with the Government in helping to stamp out what has already proved such a terrible scourge in Uganda.

The work that I saw interested me very much. Twice a day the doctor went through the hospital, treating the patients, cheering and encouraging the down-hearted, ordering food and medicine for the weak. Attended by an interpreter, he asked the various symptoms and explained to me, as we went along, the course and ravages of the disease.

The hospital itself consists of a series of buildings in the native daub and wattle style, common to Uganda, with palm thatched roofs and overhanging eaves. Down the centre of each building there is a wide aisle, and on either side of it are rows of beds, of native manufacture, whereon the patients lie covered with a blanket. Fires are kindled at intervals down this aisle, and most of the patients are too sick to do their own cooking. Some of the victims are young men and women who have strength to go about, and these live in the village in clean sanitary huts, of the ordinary Uganda type. I have seen patients brought in one night and buried the next day. On the other hand, the doctor showed me men who had had the disease for nearly two years and who were still able to keep on their feet.